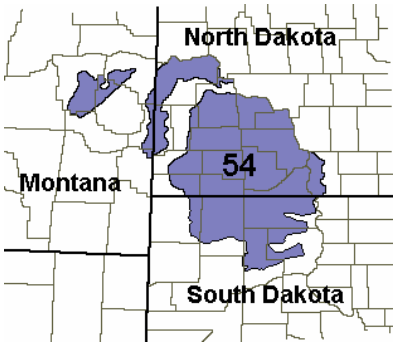
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description

Site Name: Sandy Terrace



Site Type: Rangeland

Site ID: R054XY042ND

Major Land Resource Area: 54 – Rolling Soft Shale Plain

For more information on MLRA's refer to the following web site:
http://www.essc.psu.edu/soil_info/soil_lrr/

Physiographic Features

This soil occurs on level to nearly level occasionally flooded floodplains and terraces.

Landform: Floodplain, terrace, and levee (stream) **Aspect:** NA

	Minimum	Maximum
Elevation (feet):	1600	3600
Slope (percent):	0	6
Water Table Depth (inches):	54	>72
Flooding:		
Frequency:	Rare	Occasional
Duration:	Very brief	Brief
Ponding:		
Depth (inches):	0	0
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Very low

Climatic Features

MLRA 54 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 18 inches per year. The normal average annual temperature is about 42° F. January is the coldest month with average temperatures ranging from about 13° F (Beach, ND) to about 16° F (Bison, SD). July is the warmest month with temperatures averaging from about 69° F (Beach, ND) to about 72° F (Timber Lake, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 57° F. This large annual range attests to the continental nature of this MLRA's climate. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

	Minimum	Maximum
Frost-free period (days):	119	136
Freeze-free period (days):	139	157
Mean Annual Precipitation (inches):	14	18

Average Monthly Precipitation (inches) and Temperature (ºF):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.41	0.54	2.2	23.8
February	0.37	0.61	8.7	30.4
March	0.51	1.07	17.1	40.0
April	1.13	1.88	28.9	56.8
May	1.98	2.83	40.5	69.3
June	2.83	3.29	49.8	78.3
July	2.05	2.25	54.6	85.2
August	1.49	2.07	53.0	84.3
September	1.29	1.45	42.0	73.4
October	0.89	1.35	31.6	60.4
November	0.48	0.61	19.0	41.5
December	0.42	0.55	8.1	29.0

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
ND0590	Beach	1949	1999
MT7560	Sidney	1949	1999
SD8307	Timber Lake	1948	1999
ND2183	Dickinson FAA AP	1948	1999

For local climate stations that may be more representative, refer to http://www.wcc.nrcs.usda.gov.

Influencing Water Features

Stream Type: C6
(Rosgen System)

Representative Soil Features

The common features of soils in this site are the fine sandy loam to sandy loam-textured subsoils and slopes of 1 to 6 percent. The soils in this site are well to somewhat excessively drained and formed from alluvium. The loamy fine sand to loam surface layer is 3 to 7 inches thick. The soils have a rapid to moderately rapid infiltration rate. This site should show no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

These soils are susceptible to water and wind erosion. The hazard of water and wind erosion increases where vegetative cover is not adequate. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:

North Dakota http://www.nd.nrcs.usda.gov/
South Dakota http://www.sd.nrcs.usda.gov/
Montana http://www.mt.nrcs.usda.gov/

Parent Material Kind: alluvium
Parent Material Origin: sedimentary, unspecified
Surface Texture: fine sandy loam, loamy fine sand, loam
Surface Texture Modifier: none
Subsurface Texture Group: loamy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0-10
Subsurface Fragments > 3" (% Volume): 0-5

	Minimum	Maximum
Drainage Class:	well	somewhat excessively
Permeability Class:	moderately rapid	rapid
Depth to first restrictive layer (inches):	>72	>72
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	2
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	4	6
Calcium Carbonate Equivalent (percent)*:	5	25

* - These attributes represent from 0-40 inches or to the first restrictive layer.

Plant Communities

Ecological Dynamics of the Site:
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered very stable. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can quickly return to the Historic Climax Plant Community (HCPC).

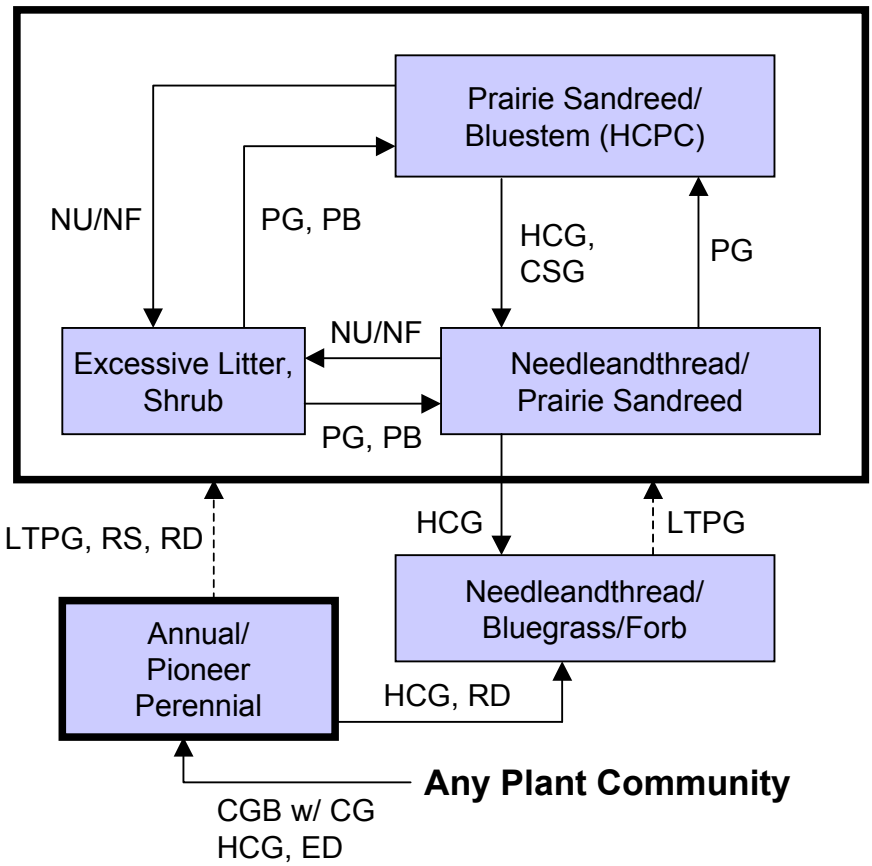
The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the HCPC. Species such as needleandthread, red threeawn, blue grama and sedges will initially increase while sand bluestem and/or big bluestem, and sideoats grama have disappeared and prairie sandreed and green needlegrass have decrease in frequency and production. Heavy continuous grazing causes blue grama, sedges and forbs to increase.

In time, heavy continuous grazing will likely cause upland sedges and blue grama to dominate and pioneer perennials, annuals, and club moss (in its range) to increase. This plant community is relatively stable and the competitive advantage prevents other species from establishing. This plant community is less productive than the HCPC. Runoff increases and infiltration will decrease. Soil erosion will be minimal. Under extended periods of non-use and/or lack of fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth bromegrass. In time, shrubs and trees such as western snowberry, chokecherry and green ash will likely increase.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CGB w/ CG - cropped go-back with continuous grazing; **CSG** - continuous seasonal grazing; **ED** - excessive defoliation; **F** - fertilization followed with prescribed grazing; **HCG** - heavy continuous grazing; **HCPC** - Historical Climax Plant Community; **LTPG** - long-term prescribed grazing; **NU/NF** - extended period of non-use & no fire; **PB** - prescribed burning followed by prescribed grazing; **PG** - prescribed grazing; **RD** - removal of disturbance; **RS** - range seeding with prescribed grazing.

Plant Community Composition and Group Annual Production

		Prairie Sandreed/Bluestem (HCPC)		
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES			*2250 - 2550*	*75 - 85*
prairie sandreed	CALO	1	450 - 600	15 - 20
BLUESTEM		**2**	**300 - 450**	**10 - 15**
sand bluestem	ANHA	2	150 - 300	5 - 10
big bluestem	ANGE	2	0 - 150	0 - 5
little bluestem	SCSC	2	0 - 60	0 - 2
NEEDLEGRASS		**3**	**150 - 300**	**5 - 10**
needleandthread	HECOC8	3	150 - 210	5 - 7
green needlegrass	NAVI4	3	60 - 150	2 - 5
porcupine grass	HESP11	3	30 - 60	1 - 2
GRAMA		**4**	**90 - 150**	**3 - 5**
blue grama	BOGR2	4	30 - 90	1 - 3
hairy grama	BOHI2	4	0 - 60	0 - 2
OTHER NATIVE GRASSES		**5**	**150 - 450**	**5 - 15**
Scribner panicum	DIOLS	5	0 - 30	0 - 1
western wheatgrass	PASM	5	150 - 210	5 - 7
sand dropseed	SPCR	5	0 - 30	0 - 1
sideoats grama	BOCU	5	0 - 60	0 - 2
prairie junegrass	KOMA	5	30 - 60	1 - 2
plains muhly	MUCU3	5	0 - 30	0 - 1
bearded wheatgrass	ELTRS	5	0 - 30	0 - 1
Canada wildrye	ELCA4	5	30 - 60	1 - 2
red threeawn	ARPUL	5	0 - 30	0 - 1
other perennial grasses	2GP	5	0 - 60	0 - 2
GRASS-LIKES		**6**	**120 - 240**	**4 - 8**
threadleaf sedge	CAFI	6	60 - 150	2 - 5
sun sedge	CAINH2	6	60 - 90	2 - 3
Penn sedge	CAPE6	6	30 - 60	1 - 2
other grass-likes	2GL	6	30 - 30	1 - 1
FORBS		*7*	*300 - 450*	*10 - 15*
American vetch	VIAM	7	30 - 60	1 - 2
cinquefoil	POTEN	7	0 - 30	0 - 1
cudweed sagewort	ARLU	7	30 - 60	1 - 2
false gromwell	ONMO	7	30 - 60	1 - 2
gayfeather	LIATR	7	30 - 60	1 - 2
goldenrod	SOLID	7	60 - 90	2 - 3
green sagewort	ARDR4	7	30 - 60	1 - 2
groundplum milkvetch	ASCR2	7	30 - 30	1 - 1
hairy goldaster	HEVI4	7	30 - 60	1 - 2
Hood's phlox	PHHO	7	0 - 30	0 - 1
penstemon	PENST	7	60 - 90	2 - 3
prairie clover	DALEA	7	30 - 60	1 - 2
prairie coneflower	RACO3	7	30 - 30	1 - 1
purple coneflower	ECAN2	7	0 - 30	0 - 1
rush skeletonweed	LYJU	7	0 - 30	0 - 1
scarlet gaura	GACO5	7	30 - 30	1 - 1
scarlet globemallow	SPCO	7	30 - 30	1 - 1
scurfpea	PSORA2	7	30 - 60	1 - 2
spiderwort	TRADE	7	30 - 30	1 - 1
stiff sunflower	HEPA19	7	30 - 60	1 - 2
wavyleaf thistle	CIUN	7	30 - 30	1 - 1
western wallflower	ERCAC	7	30 - 30	1 - 1
western yarrow	ACMI2	7	30 - 30	1 - 1
other perennial forbs	2FP	7	0 - 30	0 - 1
SHRUBS		*8*	*150 - 300*	*5 - 10*
rose	ROSA5	8	30 - 60	1 - 2
leadplant	AMCA6	8	60 - 90	2 - 3
fringed sagewort	ARFR4	8	30 - 60	1 - 2
cactus	OPUNT	8	30 - 30	1 - 1
western snowberry	SYOC	8	60 - 90	2 - 3
skunkbush sumac	RHTR	8	0 - 30	0 - 1
silver buffaloberry	SHAR	8	30 - 60	1 - 2
chokecherry	PRVI	8	30 - 30	1 - 1
dwarf false indigo	AMNA	8	30 - 30	1 - 1
creeping juniper	JUHO2	8	0 - 30	0 - 1
other shrubs	2SHRUB	8	30 - 30	1 - 1
TREES		*9*	*30 - 60*	*1 - 2*
plains cottonwood	PODEM	9	0 - 60	0 - 2
green ash	FRPE	9	0 - 60	0 - 2
bur oak	QUMA2	9	0 - 60	0 - 2
American elm	ULAM	9	0 - 60	0 - 2
other trees	2TREE	9	0 - 60	0 - 2

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	1710 -	2355	- 3010
FORBS	220 -	375	- 500
SHRUBS	145 -	225	- 325
TREES	25 -	45	- 65
TOTAL	2100 -	3000	- 3900

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative Value.

Plant Community Composition and Group Annual Production

		Prairie Sandreed/ Bluestem (HCPC)			Needleandthread/ Prairie Sandreed			Excessive Litter, Shrub			Needleandthread/ Bluegrass/Forb		
COMMON/GROUP NAME	SYMBOL	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			*2250 - 2550*	*75 - 85*		*750 - 850*	*75 - 85*		*1690 - 1950*	*65 - 75*		*455 - 560*	*65 - 80*
prairie sandreed	CALO	1	450 - 600	15 - 20	1	50 - 100	5 - 10	1	0 - 52	0 - 2	1	0 - 7	0 - 1
BLUESTEM		**2**	**300 - 450**	**10 - 15**	**2**	**0 - 10**	**0 - 1**	**2**	**0 - 26**	**0 - 1**	**2**		
sand bluestem	ANHA	2	150 - 300	5 - 10				2	0 - 26	0 - 1			
big bluestem	ANGE	2	0 - 150	0 - 5				2	0 - 26	0 - 1			
little bluestem	SCSC	2	0 - 60	0 - 2	2	0 - 10	0 - 1						
NEEDLEGRASS		**3**	**150 - 300**	**5 - 10**	**3**	**150 - 250**	**15 - 25**	**3**	**52 - 78**	**2 - 3**	**3**	**35 - 70**	**5 - 10**
needleandthread	HECOC8	3	150 - 210	5 - 7	3	150 - 250	15 - 25	3	26 - 78	1 - 3	3	35 - 70	5 - 10
green needlegrass	NAVI4	3	60 - 150	2 - 5	3	0 - 10	0 - 1	3	26 - 52	1 - 2			
porcupine grass	HESP11	3	30 - 60	1 - 2				3	0 - 52	0 - 2			
GRAMA		**4**	**90 - 150**	**3 - 5**	**4**	**50 - 80**	**5 - 8**	**4**	**0 - 26**	**0 - 1**	**4**	**35 - 70**	**5 - 10**
blue grama	BOGR2	4	30 - 90	1 - 3	4	30 - 80	3 - 8	4	0 - 26	0 - 1	4	35 - 70	5 - 10
hairy grama	BOHI2	4	0 - 60	0 - 2	4	0 - 30	0 - 3	4	0 - 26	0 - 1	4	0 - 7	0 - 1
OTHER NATIVE GRASSES		**5**	**150 - 450**	**5 - 15**	**5**	**50 - 100**	**5 - 10**	**5**	**52 - 130**	**2 - 5**	**5**	**70 - 105**	**10 - 15**
Scribner panicum	DIOLS	5	0 - 30	0 - 1	5	10 - 20	1 - 2				5	14 - 21	2 - 3
western wheatgrass	PASM	5	150 - 210	5 - 7	5	10 - 20	1 - 2	5	26 - 52	1 - 2	5	7 - 14	1 - 2
sand dropseed	SPCR	5	0 - 30	0 - 1	5	30 - 40	3 - 4	5	26 - 26	1 - 1	5	35 - 70	5 - 10
sideoats grama	BOCU	5	0 - 60	0 - 2									
prairie junegrass	KOMA	5	30 - 60	1 - 2	5	10 - 20	1 - 2	5	26 - 52	1 - 2	5	7 - 14	1 - 2
plains muhly	MUCU3	5	0 - 30	0 - 1									
bearded wheatgrass	ELTRS	5	0 - 30	0 - 1				5	0 - 26	0 - 1			
Canada wildrye	ELCA4	5	30 - 60	1 - 2	5	0 - 10	0 - 1	5	0 - 26	0 - 1			
red threeawn	ARPUL	5	0 - 30	0 - 1	5	30 - 40	3 - 4	5	0 - 26	0 - 1	5	35 - 70	5 - 10
sandbur	CELO3				5	10 - 20	1 - 2				5	14 - 21	2 - 3
inland saltgrass	DISP				5	0 - 10	0 - 1				5	7 - 14	1 - 2
other perennial grasses	2GP	5	0 - 60	0 - 2	5	10 - 20	1 - 2	5	0 - 26	0 - 1	5	0 - 7	0 - 1
GRASS-LIKES		**6**	**120 - 240**	**4 - 8**	**6**	**50 - 100**	**5 - 10**	**6**	**52 - 78**	**2 - 3**	**6**	**35 - 70**	**5 - 10**
threadleaf sedge	CAFI	6	60 - 150	2 - 5	6	50 - 100	5 - 10	6	52 - 78	2 - 3	6	35 - 70	5 - 10
sun sedge	CAINH2	6	60 - 90	2 - 3	6	20 - 30	2 - 3	6	0 - 26	0 - 1			
Penn sedge	CAPE6	6	30 - 60	1 - 2				6	0 - 26	0 - 1			
other grass-likes	2GL	6	30 - 30	1 - 1	6	10 - 20	1 - 2	6	0 - 26	0 - 1	6	0 - 7	0 - 1
NON-NATIVE GRASSES		**7**			**7**	**50 - 100**	**5 - 10**	**7**	**910 - 1300**	**35 - 50**	**7**	**105 - 140**	**15 - 20**
cheatgrass	BRTE				7	0 - 20	0 - 2	7	0 - 260	0 - 10	7	0 - 35	0 - 5
crested wheatgrass	AGCR				7	0 - 20	0 - 2	7	0 - 780	0 - 30	7	0 - 14	0 - 2
smooth bromegrass	BRIN2				7	0 - 20	0 - 2	7	0 - 910	0 - 35	7	0 - 14	0 - 2
bluegrass	POA				7	50 - 100	5 - 10	7	520 - 1170	20 - 45	7	105 - 140	15 - 20
FORBS		*8*	*300 - 450*	*10 - 15*	*8*	*100 - 150*	*10 - 15*	*8*	*260 - 390*	*10 - 15*	*8*	*105 - 161*	*15 - 23*
American vetch	VIAM	8	30 - 60	1 - 2				8	0 - 26	0 - 1			
annual sunflower	HEAN3				8	10 - 20	1 - 2	8	26 - 52	1 - 2	8	21 - 28	3 - 4
cinquefoil	POTEN	8	0 - 30	0 - 1				8	26 - 52	1 - 2			
common dandelion	TAOF				8	20 - 30	2 - 3	8	26 - 52	1 - 2	8	14 - 21	2 - 3
cudweed sagewort	ARLU	8	30 - 60	1 - 2	8	20 - 30	2 - 3	8	26 - 52	1 - 2	8	21 - 28	3 - 4
curlycup gumweed	GRSQ				8	10 - 30	1 - 3	8	0 - 26	0 - 1	8	14 - 21	2 - 3
false gromwell	ONMO	8	30 - 60	1 - 2				8	0 - 26	0 - 1			
gayfeather	LIATR	8	30 - 60	1 - 2				8	0 - 26	0 - 1			
goldenrod	SOLID	8	60 - 90	2 - 3	8	30 - 40	3 - 4	8	78 - 104	3 - 4	8	14 - 21	2 - 3
green sagewort	ARDR4	8	30 - 60	1 - 2	8	40 - 80	4 - 8	8	52 - 78	2 - 3	8	35 - 70	5 - 10
groundplum milkvetch	ASCR2	8	30 - 30	1 - 1									
hairy goldaster	HEVI4	8	30 - 60	1 - 2	8	30 - 50	3 - 5	8	26 - 52	1 - 2	8	28 - 56	4 - 8
Hood's phlox	PHHO	8	0 - 30	0 - 1	8	10 - 10	1 - 1				8	7 - 7	1 - 1
marestail	COCA5				8	10 - 20	1 - 2	8	0 - 26	0 - 1	8	28 - 42	4 - 6
penstemon	PENST	8	60 - 90	2 - 3				8	0 - 26	0 - 1			
prairie clover	DALEA	8	30 - 60	1 - 2				8	0 - 26	0 - 1			
prairie coneflower	RACO3	8	30 - 30	1 - 1	8	30 - 40	3 - 4	8	26 - 52	1 - 2	8	14 - 21	2 - 3
purple coneflower	ECAN2	8	0 - 30	0 - 1	8	0 - 10	0 - 1	8	0 - 26	0 - 1	8	0 - 7	0 - 1
pussytoes	ANTEN				8	10 - 20	1 - 2				8	14 - 21	2 - 3
Rocky Mountain beeplant	CLSE				8	10 - 20	1 - 2	8	0 - 26	0 - 1			
rush skeletonweed	LYJU	8	0 - 30	0 - 1	8	10 - 10	1 - 1	8	0 - 26	0 - 1	8	7 - 14	1 - 2
scarlet gaura	GACO5	8	30 - 30	1 - 1									
scarlet globemallow	SPCO	8	30 - 30	1 - 1	8	10 - 20	1 - 2	8	0 - 26	0 - 1	8	14 - 21	2 - 3
scurfpea	PSORA2	8	30 - 60	1 - 2	8	20 - 30	2 - 3	8	26 - 52	1 - 2	8	28 - 35	4 - 5
spiderwort	TRADE	8	30 - 30	1 - 1									
stiff sunflower	HEPA19	8	30 - 60	1 - 2				8	0 - 26	0 - 1			
sweetclover	MELIL				8	10 - 50	1 - 5	8	0 - 260	0 - 10	8	7 - 70	1 - 10
wavyleaf thistle	CIUN	8	30 - 30	1 - 1	8	30 - 50	3 - 5	8	26 - 52	1 - 2	8	28 - 56	4 - 8
western ragweed	AMPS				8	30 - 40	3 - 4	8	26 - 52	1 - 2	8	35 - 70	5 - 10
western salsify	TRDU				8	10 - 20	1 - 2	8	26 - 52	1 - 2	8	14 - 21	2 - 3
western wallflower	ERCAC	8	30 - 30	1 - 1				8	0 - 26	0 - 1			
western yarrow	ACMI2	8	30 - 30	1 - 1	8	10 - 20	1 - 2	8	26 - 52	1 - 2	8	14 - 21	2 - 3
other perennial forbs	2FP	8	0 - 30	0 - 1	8	0 - 10	0 - 1	8	0 - 26	0 - 1	8	0 - 7	0 - 1
non-native forbs	2FORB				8	10 - 20	1 - 2	8	26 - 52	1 - 2	8	7 - 35	1 - 5
SHRUBS		*9*	*150 - 300*	*5 - 10*	*9*	*50 - 100*	*5 - 10*	*9*	*260 - 390*	*10 - 15*	*9*	*35 - 70*	*5 - 10*
rose	ROSA5	9	30 - 60	1 - 2	9	10 - 20	1 - 2	9	26 - 52	1 - 2	9	7 - 14	1 - 2
leadplant	AMCA6	9	60 - 90	2 - 3				9	26 - 52	1 - 2			
yucca	YUGL				9	0 - 10	0 - 1	9	0 - 26	0 - 1	9	0 - 21	0 - 3
fringed sagewort	ARFR4	9	30 - 60	1 - 2	9	30 - 100	3 - 10	9	26 - 52	1 - 2	9	28 - 56	4 - 8
cactus	OPUNT	9	30 - 30	1 - 1	9	10 - 20	1 - 2	9	0 - 26	0 - 1	9	14 - 28	2 - 4
western snowberry	SYOC	9	60 - 90	2 - 3	9	0 - 10	0 - 1	9	130 - 260	5 - 10			
skunkbush sumac	RHTR	9	0 - 30	0 - 1	9	0 - 10	0 - 1	9	26 - 78	1 - 3			
silver buffaloberry	SHAR	9	30 - 60	1 - 2	9	10 - 10	1 - 1	9	52 - 78	2 - 3			
chokecherry	PRVI	9	30 - 30	1 - 1	9	0 - 10	0 - 1	9	26 - 52	1 - 2			
dwarf false indigo	AMNA	9	30 - 30	1 - 1				9	26 - 26	1 - 1			
creeping juniper	JUHO2	9	0 - 30	0 - 1	9	10 - 20	1 - 2	9	0 - 26	0 - 1	9	7 - 14	1 - 2
other shrubs	2SHRUB	9	30 - 30	1 - 1	9	0 - 10	0 - 1	9	0 - 26	0 - 1	9	0 - 7	0 - 1
TREES		*10*	*30 - 60*	*1 - 2*	*10*	*10 - 10*	*1 - 1*	*10*	*78 - 130*	*3 - 5*	*10*	*0 - 7*	*0 - 1*
plains cottonwood	PODEM	10	0 - 60	0 - 2	10	10 - 10	1 - 1	10	0 - 130	0 - 5	10	0 - 7	0 - 1
green ash	FRPE	10	0 - 60	0 - 2	10	10 - 10	1 - 1	10	52 - 130	2 - 5	10	0 - 7	0 - 1
bur oak	QUMA2	10	0 - 60	0 - 2	10	10 - 10	1 - 1	10	0 - 130	0 - 5	10	0 - 7	0 - 1
American elm	ULAM	10	0 - 60	0 - 2	10	10 - 10	1 - 1	10	0 - 130	0 - 5	10	0 - 7	0 - 1
other trees	2TREE	10	0 - 60	0 - 2	10	10 - 10	1 - 1	10	0 - 130	0 - 5	10	0 - 7	0 - 1

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	1710 - 2355 - 3010	555 - 790 - 1025	1285 - 1846 - 2415	270 - 511 - 750
FORBS	220 - 375 - 500	95 - 125 - 155	220 - 325 - 425	100 - 133 - 165
SHRUBS	145 - 225 - 325	45 - 75 - 105	220 - 325 - 425	30 - 53 - 75
TREES	25 - 45 - 65	5 - 10 - 15	75 - 104 - 135	0 - 4 - 10
TOTAL	2100 - 3000 - 3900	700 - 1000 - 1300	1800 - 2600 - 3400	400 - 700 - 1000

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Prairie Sandreed/Bluestem Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for adequate recovery periods following each grazing event.

The potential vegetation is about 73% grasses and grass-like plants, 15% forbs, 10% shrubs, and 2% trees. Major grasses include prairie sandreed, bluestems and needlegrasses. Other grasses occurring on this community include bearded wheatgrass, Canada wildrye, sideoats grama, blue grama, western wheatgrass and sedge. Major forbs and shrubs include American vetch, cudweed sagewort, western yarrow, sunflower, leadplant, western snowberry, chokecherry and fringed sagewort. Scattered green ash, plains cottonwood and American elm may occur.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary in production depending on growing conditions (timing/amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. Run-off from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: ND5403
Growth curve name: Missouri Slope, Native Grasslands, Warm-season dominant.
Growth curve description: Warm-season, tall/mid grass dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	1	5	20	38	25	8	3	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Non-use and no fire for extended periods of time will convert this plant community to the *Excessive Litter, Shrub Plant Community*.
- Heavy, continuous grazing will convert the plant community to the *Needleandthread/Prairie Sandreed Plant Community*.
- Continuous seasonal (i.e. spring) grazing will convert the plant community to the *Needleandthread/Prairie Sandreed Plant Community*.
- Excessive defoliation (i.e., areas of heavy animal concentration) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Needleandthread/Prairie Sandreed Plant Community

This plant community can slowly develop from the adverse effects of continuous grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed.

Needleandthread and prairie sandreed are the dominant species. Prairie sandreed and green needlegrass have been reduced. Big bluestem, sand bluestem, porcupine grass, sideoats grama, spiderwort and prairie clover have greatly reduced. Forb species include green sagewort, cudweed sagewort, prairie coneflower, silverleaf scurfpea, western ragweed and western salsify. Leadplant, western snowberry, chokecherry have been reduced while other woody species would tend to be heavily browsed. Fringed sagewort has increased.

This plant community is relatively stable and less productive than the HCPC. Reduction of litter and plant cover results in higher soil temperatures, poor water infiltration rates, increased runoff and high evapo-transpiration rates. This plant community can occur throughout the site, on spot grazed areas, and around water sources where season-long grazing patterns occur. Soil erosion will be minimal.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: ND5402
Growth curve name: Missouri Slope, Native Grasslands, Cool/Warm-season Mix.
Growth curve description: Cool-season/tall warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	6	21	40	20	6	4	1	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy continuous grazing without adequate recovery opportunity between grazing events will move this plant community across an ecological threshold to the *Red Threeawn/Bluegrass/Forb Plant Community*.
- Prescribed grazing with adequate recovery periods following each grazing event and proper stocking will shift this plant community back to the *Prairie Sandreed/Bluestem Plant Community (HCPC)*.
- Non-use and no fire for extended periods of time will convert this plant community to the *Excessive Litter, Shrub Plant Community*.
- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Excessive Litter, Shrub Plant Community

This plant community develops after an extended period (10 to 20 years) of non-use or exclusion of fire. Eventually litter levels become high enough to reduce native grass vigor, diversity and density.

Kentucky bluegrass, crested wheatgrass and/or smooth bromegrass tend to invade and may dominate this plant community. Common forbs include sweetclover, cudweed sagewort, green sagewort, and goldenrod species. Shrubs such as western snowberry, buffaloberry and chokecherry will increase in density and cover and eventually tree species such as green ash will also increase.

This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire is most effective in moving this it toward the HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once the advanced stage of this plant community is reached, time and external resources will be needed to see any immediate recovery in the diversity of the site.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: ND5406
Growth curve name: Missouri Slope, Introduced Cool-season Grasses.
Growth curve description: Introduced cool-season grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	35	35	5	2	8	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing or prescribed burning followed by prescribed grazing, will move this plant community toward the *HCPC*. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.
- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Needleandthread/Bluegrass/Forb Plant Community

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. It is made up of needleandthread, red threeawn, sand dropseed, sedges and undesirable forbs scattered within a sod of bluegrass. Low vigor western wheatgrass and prairie junegrass can be found scattered throughout the community. At this level of departure from HCPC, green needlegrass has been removed. Green sagewort, scurfpea, curlycup gumweed, ragweed, hairy goldaster, dandelion, wavyleaf thistle and sweetclover have increased. Key shrubs have been severely reduced in vigor or removed completely. Shrubs that have increase are fringed sagewort and cactus. Remnant trees remain with no regeneration apparent.

This plant community is resistant to change due to grazing tolerance of red threeawn and bluegrass. A significant amount of production and diversity has been lost when compared to the HCPC. Loss of cool season grasses, tall warm-season grasses, shrub component and nitrogen fixing forbs have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced. Soil loss may be accelerated where concentrated flows occur.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:
Growth curve number: ND5408
Growth curve name: Missouri Slope, Sedge Dominant.
Growth curve description: Cool-season, short grasses and grass-likes.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	30	25	20	5	5	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Excessive defoliation (i.e., areas of heavy animal concentration,) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.
- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

- Long-term prescribed grazing with adequate recovery periods following each grazing event can move this plant community toward the *Needleandthread/Prairie Sandreed Plant Community.* It may eventually return to the *HCPC* or associated successional stages assuming an adequate seed/vegetative source is available. This process may take greater than 15 years.

Annual/Pioneer Perennial Plant Community

This plant community develops under severe disturbance and/or excessive defoliation. This can result from heavy livestock or wildlife concentration, and cropping abandonment (go-back land). The dominant vegetation includes pioneer annual grasses, forbs, invaders, and early successional biennial and perennial species. Grasses may include red threeawn, smooth bromegrass, annual brome, crested wheatgrass, needleandthread, sand dropseed, sandbur, Scribner's Panicum and prairie junegrass. The dominant forbs include curlycup gumweed, marestail, salsify, kochia, field bindweed, thistles, western ragweed, cudweed sagewort, pussytoes and other early successional species. Shrubs that may be present include prairie rose. The community is susceptible to invasion of other non-native species due to severe soil disturbances and relatively high percent of bare ground.

This plant community is resistant to change, as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession. Soil erosion is potentially high. Reduced surface cover, low plant density, low plant vigor, loss of root biomass, and soil compaction, all contribute to decreased water infiltration, increased runoff, and accelerated erosion rates.

Significant economic inputs and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new plant community. The total annual production ranges from 500 to 1100 lbs./ac. (air-dry weight) depending upon growing conditions.

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Under long-term prescribed grazing and removal of disturbance, including adequate rest periods, this plant community will move through the successional stages, and may eventually lead to the *Needleandthread/Prairie Sandreed Plant Community*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly. This process will take a long period of time (25+ years).
- Removal of disturbance followed by range seeding with deferment and prescribed grazing can convert this to a plant community resembling the *Prairie Sandreed/Bluestem Plant Community*.
- Removal of disturbance followed by heavy, continuous grazing will slowly move this plant community towards the *Red Threeawn/Bluegrass/Forb Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Prairie Sandreed/Bluestem Plant Community (HCPC):

Needleandthread/Prairie Sandreed Plant Community:

Red Threeawn/Bluegrass/Forb Plant Community:

Excessive Litter, Shrub Plant Community:

Annual/Pioneer Perennial Plant Community:

Animal Preferences (Quarterly – 1,2,3,4†)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
rasses & Grass-likes							
bearded wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
bluegrass	U D U U	D P U D	U D U U	U P N D	U P N D	U D U U	U D U U
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
cheatgrass	U D U U	N P U N	U D U U	N P U N	N P U N	U D U U	U D U U
crested wheatgrass	U P U D	U P N N	U P U D	U P N N	U P N N	U P U D	U P U D
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
hairy grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
Penn sedge	U P U D	U P N D	U P U D	U D U D	U D U D	U P U D	U P U D
plains muhly	U U D U	U U D U	U U D U	N N N N	N N N N	U U D U	U U D U
porcupine grass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
red threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
sand bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
sand dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
Scribner panicum	U U D U	N U N N	U U D U	N U N N	N U N N	U U D U	U U D U
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P U
smooth bromegrass	U P U U	U P U U	U P U U	U P U U	U P U U	U P U U	U P U U
sun sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
threadleaf sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
cinquefoil	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
false gromwell	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
groundplum milkvetch	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
Hood's phlox	U D U U	U P P U	U D U U	U P P U	U P P U	U D U U	U P P U
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
scarlet gaura	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
scarlet globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
spiderwort	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
stiff sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
wavyleaf thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western wallflower	U D U U	N U U N	U D U U	N U U N	N U U N	U D U U	N U U N
western yarrow	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
hrubs							
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
creeping juniper	U N N U	U N N U	U N N U	U N N U	U N N U	U N N U	U N N U
dwarf false indigo	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
silver buffaloberry	D U U U	D U U U	D U U U	P U D P	U U U U	D U U U	D U U U
skunkbush sumac	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D	D U U D
western snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
ees							
American elm	N N N N	N N N N	N N N N	N U D N	N N N N	N N N N	N N N N
bur oak	T T T T	T T T T	N N N N	N U D U	N N N N	T T T T	N U D U
green ash	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended.* These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process and may need to be adjusted due to diet preferences of other types or kinds of livestock and/or other factors. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Production (lbs./acre)	Carrying Capacity [1] (AUM/acre)
Prairie Sandreed/Bluestem	3000	0.95
Needleandthread/Prairie Sandreed	1000	0.32
Red Threeawn/Bluegrass/Forb	700	0.22 [2]
Excessive Litter, Shrub	2600	0.82 [2]
Annual/Pioneer Perennial	-- [3]	-- [3]

[1] Continuous season-long grazing by cattle under average growing conditions.
[2] Stocking rates may need to be adjusted due to palatability and/or availability of forage.
[3] Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups A and B, with localized areas in hydrologic group D. Infiltration varies from rapid to moderately rapid and runoff potential varies from negligible to very low depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a dense sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

Seed harvest of native plant species can provide additional income on this site.

Supporting Information

Associated Sites

(054XY023ND) – Loamy Overflow
(054XY041ND) – Loamy Terrace
(054XY025ND) – Sands
(054XY026ND) – Sandy
(054XY034ND) – Thin Sands

Similar Sites

(054XY023ND) – Loamy Overflow (LyOv)
[Moderately well drained soils in intermittent drainage ways, swales and areas that frequently receive additional moisture throughout the growing season, with no apparent water table. Indicator species: big bluestem with western wheatgrass and green needlegrass, American licorice, and western snowberry. This site has no prairie sandreed and sand bluestem, far more big bluestem, frequent flooding events, more production.]

(054XY041ND) – Loamy Terrace (LyT)
[Well drained soils on a river or stream terrace in a position that will flood occasionally (once in ten years) with no apparent water table. Down slope from loamy, sandy, clayey, and sands, and upslope form subirrigated ecological sites. Indicator species are western wheatgrass evenly mixed with green needlegrass, American vetch, and western snowberry or silver sagebrush, and with possible trees. This site has no prairie sandreed, sand bluestem, less sedges and shrubs, more green needlegrass, western wheatgrass, blue grama, similar production, and landscape position.]

(054XY026ND) – Sandy (Sy)
[Does not receive additional moisture. Found on dry uplands upslope from sandy terraces or loamy overflow sites, down slope from limy sands or shallow sandy sites. Similar landscape position as loamy, sands, clayey sites; will ribbon up to 1 inch. Indicator species are prairie sandreed with western wheatgrass and green needlegrass intermixed. This site has less production, different landscape position and no potential to flood, similar species composition with less silver sagebrush and/or western snowberry and sporadic trees.]

(054XY027ND) – Sandy Claypan (SyCp)
[Well drained soils on uplands and terraces that don’t receive extra moisture with a dense sodic subsoil below 6 inches with salts below 16 inches. Subsoil will ribbon up to 1 inch. Indicator species are western wheatgrass intermixed with areas of prairie sandreed both dominating with an understory of needleandthread and blue grama, heath aster, cudweed sagewort and western yarrow along with fringed sagewort. This site has dense sodic subsoil below 6 inches with salts below 16 inches, far more western wheatgrass, blue grama, less prairie sandreed, and sand bluestem, with less silver sagebrush and/or western snowberry and no sporadic trees, less production.]

(054XY034ND) – Thin Sands (TSa)
[Deep entisol found on knobs and ridges of level to choppy sand blown plains; will not ribbon, found upslope from sands and sandy terrace sites; won’t ribbon. Indicator species: Sand bluestem, prairie sandreed and needleandthread evenly mixed, some Canada wildrye, penstemon, lemon scurfpea western ragweed, yucca, silky prairie clover and leadplant. This site has less production, thin “A” horizon and has a non-mollic epipedon, more little bluestem, less prairie sandreed, green needlegrass and shrubs, no trees, can be in the same landscape positions, but has very little potential to receive additional moisture through occasional flooding.]

Inventory Data References

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field tested by various private, State and Federal agency specialist.

Those involved in developing this site description include: Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Stan Boltz, NRCS Range Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; L. Michael Stirling, NRCS Range Management Specialist; David Dewald, NRCS State Biologist; and Brad Podoll, NRCS Biologist.

Those involved in developing this site description include: Dennis Froemke, NRCS Range Management Specialist; Stan Boltz, NRCS Range Management Specialist and Darrell VanderBusch, NRCS Resource Soil Scientist.

Data Source	Number of Records	Sample Period	State	County
SCS-RANGE-417	0			
Ocular estimates	3	1998 -2001	ND; SD	Dunn, Morton, Stark

State Correlation

This site has been correlated with North Dakota and South Dakota in MLRA 54.

Field Offices

Baker, MT	Buffalo, SD	Faith, SD	Mott, ND
Beach, ND	Carson, ND	Hettinger, ND	Selfridge, ND
Beulah, ND	Culbertson, MT	Killdeer, ND	Sidney, MT
Bison, SD	Dickinson, ND	Mandan, ND	Watford City, ND
Bowman, ND	Dupree, SD	McIntosh, SD	Wibaux, MT

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43a – Missouri Plateau.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)

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Site Description Approval

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State Range Management Specialist	Date	State Range Management Specialist	Date
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State Range Management Specialist	Date		